Land Use Change during the Recovery Process –

The Problem Is…

Rebuilding after an earthquake involves a complex coordination of public and private investor decisions. While residents may desire to rebuild their community in precisely the way it was before the disaster, other factors may make it economically infeasible or may provide opportunities to improve a community in the process. In a sense, a major earthquake provides instantaneous, unplanned, mandated redevelopment.

Demolition of San Francisco Embarcadero Freeway led to a walkable pedestrian boulevard

The 1989 Loma Prieta earthquake provided opportunities to redevelop the area around the Oakland City Hall, as well as in the vicinity of the Cypress Freeway collapse.

It also spurred a rejuvenation of the waterfront area of San Francisco when the Embarcadero Freeway had to be torn down.

The area of downtown Santa Cruz was rebuilt, but it is not the same as it was before the earthquake, in spite of the protests of those in the neighborhood.

Conversely, Hurricane Katrina accelerated trends in development and degradation that had been building for many years prior to that disaster. The public-private multi-organizational decision-making process for rebuilding is still continuing.

Planning takes time but the pressures to rebuild quickly are enormous after a disaster, as are the issues related to financing. Federal funds dominate the reconstruction process of public facilities and actions taken to reduce risk are likely the ones that the federal government is willing to fund. But federal funding requirements do not always meet community objectives for rebuilding. For example, the federal government does not usually fund replacement of a building in a different location than it was originally built.

Rebuilding private residents and businesses will require private capital. 88% of residential homes that are covered by homeowners insurance are not insured for earthquakes and deductibles are high (average $60,000) for those who are insured. Less than 5% of residential losses are expected to be covered by insurance in an earthquake. These obstacles will slow recovery time of housing, especially in lower- and middle-income neighborhoods, and delay the recovery time of small businesses serving those neighborhoods, leading to blighted neighborhoods.

Pressure from private owners will be strong after a disaster to rebuild even in the most obviously hazardous areas, particularly if the land is left in private ownership and without adequate land use restrictions. Residents of these areas will be a powerful, cohesive group supporting federal, state, and local actions that would permit rebuilding homes on hazardous sites.

What Can Be Done?

Local governments can face such challenges by being prepared with alternative land use strategies and fostering community consensus on objectives for rebuilding before the disaster. Land use decisions which effectively reduce seismic risk are most likely to be made when they are consistent with other community objectives. Developing reconstruction priorities will also show federal funding agencies how proposed projects fit into long-term community goals.

Redevelopment is an effective way to achieve land use change in heavily damaged areas and rebuild in a way that reduces seismic risk while meeting other community goals.

New housing and commercial buildings take money to build – and those new buildings cost more, in terms of mortgages, leases, and rents. Businesses that could once afford to locate in older neighborhoods can no longer afford the higher rents. Redevelopment can help maintain affordable housing and commercial space.

Local governments will need to plan for the conflicting pressures of rebuilding in exactly the same places with exactly the same densities and patterns as before the disaster. Building codes, fire codes, and landslide mitigation can mitigate the effects of these hazards, but cannot eliminate the threat of damage – no building is earthquake, fire or flood "proof".

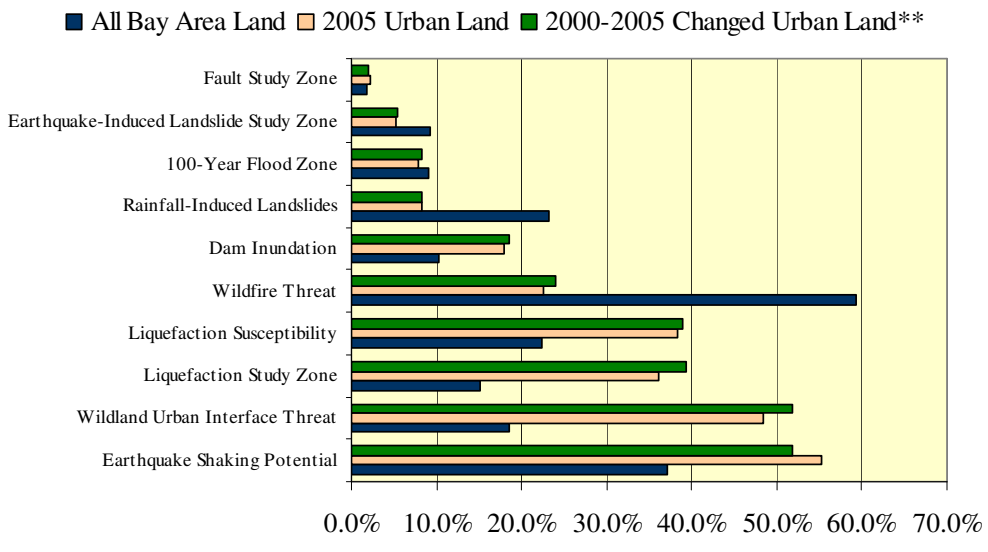
The State of California has passed several laws related to land use and disaster mitigation. First, the *Alquist-Priolo Earthquake Fault Zoning Act* of 1972 is intended to prevent new development astride known active fault traces. Second, the *Seismic Hazards Mapping Act* of 1990 requires the preparation of site-specific geotechnical reports for development proposals in areas identified as Zones of Required Investigation for earthquake-induced landslides or liquefaction as designated by the State Geologist. Both these Acts require disclosure to potential buyers in these zones. Some cities have also developed additional geologic study zones, which restrict building in hazardous areas.

A city or county has approximately a 30-day window of opportunity after a disaster to learn new land use lessons and implement a new community vision. This vision must be developed before the disaster with community input and buy in. The task of creating a new vision and in a post-disaster environment will be extremely difficult.

The Bay Area is growing in hazard areas.

From 2000 to 2005, Bay Area added 312,738 people and 117,060 new households. Urban land* totaled 1,075,200 acres in 2000. The region added 63,700 acres of new or significantly denser urban development from 2000 to 2005. The Bay Area is projected to continue to grow, adding 1,977,200 more people, 719,700 new households, and 1,657,650 new jobs between 2005 and 2035 (Source: ABAG's **Projections 2009** and ABAG's **Existing Land Use in 2005**).

As shown on the following graph, during the period from 2000 to 2005, we continued to build in hazardous areas – in spite of numerous regulations. Part of the reason for this trend is that we are convinced that actions can be taken to mitigate the impacts of those hazards.



For example, while **22.3%** of the region's land is subject to liquefaction (based on **2000** liquefaction susceptibility mapping), **39.9%** of the land newly developed or redeveloped from 2000-2005 is in these areas. In addition, while **18.5%** of the region's land is in a wildland-urban-interface (WUI) fire threat area (again, based on mapping available **at that time**), amazingly, **51.8%** of the land newly developed or redeveloped from 2000-2005 is in these areas.

* Urban land is non-agricultural developed land, that is, residential, commercial, industrial, infrastructure, military, and public/institutional uses.

** See the Local Hazard Mitigation Plan for the Bay Area **Appendix E** for definitions of areas on maps defined as "hazard areas" and for more specific information on land use and land use change in these areas. The maps used for this analysis were maps available in 2005 because they would have been available at that time to guide land use decisions. Thus, the most current hazard maps were not used in this assessment.

This growth continues to place increasing pressure on the region to expand urban development, both by increasing the density of areas of existing urban and inner suburban housing, and by the conversion of agricultural and grazing lands to suburban development.

Definitions –

Redevelopment	Reconstruction
Redevelopment refers to the process of turning a developed area that is suffering deterioration, loss of vitality, or obsolescence into a community asset. Specifically, it is a legal process under which the states grant local governments special powers to address urban blight (Spangle and Associates, 2002).	Reconstruction is a broad set of activities undertaken by public entities to repair and rebuild, or induce the private sector to repair and rebuild, a city's physical assets, including structures, facilities and, infrastructure, after a disaster. Most damage after disasters is repaired by the property owners, but in rare instances where the damage is widespread or is concentrated in areas where the community sees potential to improve the area, the city may intervene to achieve the desired results (Spangle and Associates, 2002).

Ideas for Local Government Action

The following recommendations for action have been compiled based on recommendations adapted from the listed references and the experiences of past disasters to speed recovery of local governments, as well as lead to more rapid economic recovery for the region overall. The ideas for action listed below emphasize the role of these non-emergency response staff in long-term recovery both before and after a disaster.

Summary of Possible Action	Department
Examine ABAG's FOCUS program Priority Development Areas (PDAs) and Priority Conservation Areas (PCAs) in terms of hazards. Promoting growth away from hazardous areas is a good way to reduce damage in a disaster and may provide an opportunity for speeding their development after a disaster.	Planning
Consider the use of a Science and Engineering Taskforce to guide reconstruction in hazardous areas following a disaster, similar to the taskforce that was developed in Anchorage, Alaska following the devastating 1964 earthquake.	Planning
Consider possible changes in land use after a disaster to promote more sustainable post disaster reconstruction. (For example, existing development in hazardous areas such as landslide-prone, or liquefaction areas might be converted to open space after a disaster to prevent future damage in those areas. The City may also have the opportunity to promote denser growth in areas near downtown closer to transportation and job centers after a disaster rather than in outlying areas).	Planning
Make sure that the General Plan (particularly the Safety and Land Use elements) is up to date and consistent with local zoning so that the future of damaged commercial areas and residential neighborhoods is pre-planned, and not decided during a crisis.	Planning
Consider where you would zone for location of temporary housing and business districts. These temporary locations begin with the intention of getting residents into homes and allowing businesses to continue to operate, but often become more permanent than originally intended.	Planning
Examine your General Plan and zoning in commercial areas to see if major damage to those areas might result in an unintentional loss of the historic or pedestrian friendly character of the area. (For example, current parking requirements for replacement construction might preclude rebuilding a pedestrian-friendly downtown.)	Planning
Enforce the Alquist-Priolo Zone and Seismic Hazard Zone Mapping Acts with the understanding that some areas may be determined to not be able to be rebuilt in a cost-effective manner. Consider developing geologic hazard study zones that go beyond the requirements of the above acts.	Zoning

Summary of Possible Action (continued)	Department
Develop well-defined community development objectives with public input to help federal, state, and local officials set reconstruction priorities and judge the public acceptability of potential land use changes or restrictions.	Planning
Adopt a repair and reconstruction ordinance to make sure that both private and public buildings are not only repaired to their pre-existing condition, but also repaired to a standard that reduces the likelihood of future damage in a flexible, cost-effective manner. This will increase the likelihood that FEMA will reimburse for replacement costs of updated buildings.	Planning, Building and Code Enforcement
Keep your neighborhood and specific plans up to date. This will help foster community involvement and buy in for planned land use change and develop consensus around post disaster vision for reconstruction of specific neighborhoods.	Planning
Pre-plan ways to promote preservation of Historic Districts during the rebuilding process	Planning, Building, and Redevelopment
Promote sustainable floodplain management practices with the understanding that some areas may be determined to not be able to be rebuilt in a cost-effective sustainable manner.	Planning
Develop plans to implement and initiate redevelopment as needed after an earthquake. Keep redevelopment plans up to date or develop plans for older areas likely to be damaged in a disaster to be in a position to move quickly into a redevelopment agency, if needed, after a disaster.	Redevelopment Agency with Planning
Familiarize applicable staff (e.g. planning, zoning, and housing) with geologic hazard related information so they can anticipate what kinds of damage may occur and where. Help them to understand appropriate responses and land use changes and be ready to implement them after a disaster.	Public Works (or City Geologist)

NEXT STEPS FOR ABAG –

The following issues were discussed at the Regional Planning Committee meeting in December 2009.

ROLE FOR REGIONAL COORDINATION

What role does (and should) ABAG have in this process?

What role does ABAG's FOCUS initiative have and how can (or should) it be broadened to begin to cover this issue?

LOCAL GOVERNMENT PLANNING

What mechanisms do (and should) cities and counties currently have for planning for disaster-driven land-use change?

POSSIBLE POLICY CHANGES

What impediments currently exist to post-disaster land use planning?

CREDITS – Prepared by Jeanne Perkins and Danielle Hutchings. **PHOTO CREDITS –** page 1. via vision63 at flikr

REFERENCES – William Spangle and Associates, 1980. *Land Use Planning After Earthquakes.*
J. Schwab with K. Topping, C. Eadie, R. Deyle and R. Smith, 1998. *Planning for Post-Disaster Recovery and Reconstruction.*
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Spangle Associates, Urban Planning and Research, 2002. *Redevelopment after Earthquakes.*

This issue paper is one of eight discussing long-term recovery planning issues that will continue beyond 60 or 90 days after a major regional disaster.